

Status of the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (currently amended) A deformable optical system, comprising:
 - a reflection device having a first reflecting surface and a second surface;
 - a piezoelectric actuator having a piezoelectric chuck and moveable extensions including piezoelectric pins, strips, or concentric rings, each of the extensions being coupled at a first end to a surface of the piezoelectric chuck and at a second end to the second surface of the reflection device;
 - electrodes individually coupled to corresponding ones of the extensions;
 - and
 - a controller coupled to the electrodes, configured to control movement of the extensions via the electrodes,
 - wherein the control system measures a change in capacitance of the extensions to determine characteristics of movement of the extensions.
2. (original) The deformable optical system of claim 1, wherein the reflection device is a mirror.
3. (cancelled)
4. (previously presented) The deformable optical system of claim 1, further comprising:
 - a conductive coating on the surface of the piezoelectric chuck; and
 - a conductive coating on the electrodes.

5. (previously presented) The deformable optical system of claim 1, further comprising:

a measuring system configured to measure a wavefront aberration, wherein the controller controls the extensions based on the measured wavefront aberration.

6. (original) The deformable optical system of claim 5, wherein a number of the extensions used corrects higher order portions of the measured wavefront aberration.

7. (original) The deformable optical system of claim 5, wherein a number of the extensions used corrects for all orders of the measured wavefront aberration.

8. (cancelled)

9. (previously presented) The deformable optical system of claim 28, wherein a number of the extensions used corrects at least one of Zernike polynomial terms and other representations of the wavefront error.

10. (cancelled)

11. (currently amended) The deformable optical system of claim 1 ~~claim 10~~, wherein the characteristic of movement of the extensions corresponds to a characteristic of movement of the first reflecting surface.

12. (original) The deformable optical system of claim 1, wherein the reflection device is substantially planar.

13. (original, previously withdrawn) The deformable optical system of claim 1, wherein the reflection device is curved.

14. (original) The deformable optical system of claim 1, wherein a height of the extensions correlates to an amount of decoupling of the extensions from each other.

15. (original) The deformable optical system of claim 1, wherein the extensions are from less than 1 micron to more than 1 millimeter in width or diameter.

16. (currently amended) A deformable optical device, comprising:
a reflection device having a first reflecting surface and a second surface;
a piezoelectric device having a piezoelectric chuck and moveable extensions including piezoelectric pins, strips, or concentric rings, each of the extensions being coupled at a first end to a surface of the piezoelectric chuck and at a second end to the second surface of the reflection device; and
electrodes coupled to corresponding ones of the extensions,
wherein a controller is used to measure a change in capacitance of the extensions to determine characteristics of movement of the extensions.

17. (original) The deformable optical device of claim 16, wherein the reflection device is a mirror.

18. (cancelled)

19. (previously presented) The deformable optical device of claim 16, further comprising:

a conductive coating on the surface of the piezoelectric chuck; and
a conductive coating on the electrodes.

20. (original) The deformable optical device of claim 16, wherein the reflection device is substantially planar.

21. (original, previously withdrawn) The deformable optical device of claim 16, wherein the reflection device is curved.

22. (previously presented) The deformable optical device of claim 16, wherein the extensions are from less than 1 micron to more than 1 millimeter in diameter or width.

23-25 (cancelled)

26. (original) The deformable optical system of claim 1, wherein a number of the extensions is at least up to 1 million per square millimeter.

27. (Cancelled)

28. (previously presented) The deformable optical system of claim 1, further comprising:

a measuring device configured to determine a wavefront error.

29. (currently amended) The deformable optical device of claim 16, wherein the electrodes are coupled, via the controller, to a measuring system that is configured to generate a voltage value corresponding to a measured wavefront aberration, the voltage value being used by the electrodes, via the controller, to control movement of the extensions.